

About the Developmental Studies Center

Our Mission

Developmental Studies Center (DSC) is a nonprofit organization dedicated to children's academic, ethical, and social development. Since 1980, DSC has developed school-based and after-school programs that help children develop capacities to think deeply and critically so they will continue learning throughout their lives and strengthen their commitment to such values as kindness, helpfulness, personal responsibility, and respect for others.

DSC's Programs Develop Skills and Community

Programs for use in classrooms

Caring School Community™ • Grades K–6

The Caring School Community (CSC) program is a nationally recognized, research-based program that builds community—in the classroom, across grades, schoolwide, and with families.

Making Meaning® • Grades K–8

The Making Meaning program is a reading comprehension curriculum that teaches comprehension strategies through read-alouds, collaborative structures, and reflective partner work.

SIPPS® (Systematic Instruction in Phoneme Awareness, Phonics, and Sight Words) • Grades K–12

The SIPPS program teaches decoding systematically. It is designed specifically for intervention and covers single-syllable decoding, short vowels, simple consonants, complex vowels, consonant digraphs, polysyllabic strategies, and high-frequency sight words.

Being a Writer™ • Grades K–5

The Being a Writer program is a yearlong writing curriculum—the first program of its kind to bring together the latest research in teaching writing with support for students' social and ethical development. (Available August 2007)

Programs for out-of-school time

AfterSchool KidzLit® • Grades K–8

The AfterSchool KidzLit program is a literacy enrichment program consisting of terrific read-aloud books, and discussions and activities that help kids make connections between the stories, their own lives, and the world.

AfterSchool KidzMath™ • Grades K–6

The AfterSchool KidzMath program provides academic enrichment using cooperative math games and literature-based activities. Kids deepen their understanding and practice important math skills—and have fun.

Science Explorer • Grades K–6

Science Explorer is an inquiry-based, interactive program of experiments using ordinary materials that inspire students to explore scientific principles.

Math Explorer • Grades 6–8

Math Explorer invites children to fly planes, launch rockets, learn card tricks, and make cool stuff to take home—all while practicing the important math skills middle-school students need extra help with.

For more information, please visit www.devstu.org or contact us by phone at 800.666.7270.



**DEVELOPMENTAL
STUDIES CENTER™**

Nonprofit. Research Based. Mission Driven. Since 1980.

Effects of an Elementary School Intervention on Students' "Connectedness" to School and Social Adjustment During Middle School

Victor Battistich,^{1,2} Eric Schaps,¹ and Nance Wilson^{1,3}

This research examined the effects at follow-up during middle school of a comprehensive elementary-school intervention program, the Child Development Project, designed to reduce risk and promote resilience among youth. Parental consent to participate in the middle school study was obtained for 1,246 students from six program and six matched comparison elementary schools. Three of the program elementary schools were in the "high implementation" group, and three were in the "low implementation" group during the elementary school study. Findings indicated that, studywide, 40% of the outcome variables examined during middle school showed differences favoring program students, and there were no statistically reliable differences favoring comparison students. Among the "high implementation" group, 65% of the outcome variables showed differences favoring program students. Overall, program students were more engaged in and committed to school, were more prosocial and engaged in fewer problem behaviors than comparison students during middle school. Program students who experienced high implementation during elementary school also had higher academic performance, and associated with peers who were more prosocial and less antisocial than their matched comparison students during middle school. Implications of these findings for prevention programming are discussed.

KEY WORDS: caring community of learners; health promotion model; influence of social context on prevention.

The findings from decades of research have resulted in considerable advances in understanding of the etiology and prevention of problem behaviors (e.g., Coie et al., 1993; O'Connor & Rutter, 1996; Tolan, Guerra, & Kendall, 1995; Yoshikawa,

¹Developmental Studies Center, Oakland, California.

²Address correspondence to Victor Battistich, (now at) University of Missouri, St. Louis, MO 63121.

³Now at the Public Health Institute, Berkeley, CA.

1994; Zimmerman & Arunkumar, 1994). Several recent reviews (e.g., Catalano, Berglund, Ryan, Lonczak, & Hawkins, 1999; Center for Substance Abuse Prevention, 1999; Greenberg, Domitrovich, & Bumbarger, 2001) have documented the effectiveness of a number of intervention programs for preventing social problems such as drug use, mental illness, and violence, and/or promoting healthy development among youth. Yet, surveys of nationally-representative samples continue to show that problem behaviors are prevalent among adolescents (Brener, Simon, Krug, & Lowry, 1999; Johnson, O'Malley, & Bachman, 2001).

The Child Development Project (CDP) is a comprehensive, whole-school intervention program that seeks to foster students' social, ethical, and intellectual development through helping elementary schools to become *caring communities of learners*—environments that are characterized by caring and supportive relationships, and collaboration among and between students, staff, and parents; a sense of common purpose and a clear commitment to salient norms and values of caring, justice, responsibility, and learning; responsiveness to students' developmental and sociocultural needs; an accessible, meaningful and engaging curriculum; and opportunities for students to meaningfully participate in decision-making and otherwise be actively involved in the intellectual and social life of the classroom and school. The program's theoretical rationale, approach, and practices have been extensively described elsewhere (Battistich, Schaps, Solomon, & Watson, 1991; Battistich, Solomon, Watson, & Schaps, 1997; Watson, Solomon, Battistich, Schaps, & Solomon, 1989). Briefly, in order to create a social context that can be characterized as a caring community of learners, CDP has incorporated a variety of elements into a coherent, comprehensive program for elementary schools. These include: (a) an intensive classroom program (involving three major elements: collaborative learning, a literature-based language arts curriculum, and "developmental discipline," an approach to classroom management that emphasizes the development of students' self-control and personal responsibility); (b) a schoolwide component; and (c) a family involvement component. CDP is an ecological intervention (Bronfenbrenner, 1977) that influences all aspects of the school—curriculum, pedagogy, organization, management, and climate.

As a preventive intervention, CDP differs from most current programs in a number of ways (Battistich, Schaps, Watson, Solomon, & Lewis, 2000). In particular, CDP's emphasis is on the *promotion* of positive development among all children and youth, rather than on the *prevention* of disorder among those deemed at risk. CDP thus is a broader and more basic approach to primary prevention than are risk-driven programs that concentrate on preventing disorder. The potential benefits of promoting positive development among all youth, not just those with identified risk factors, has been recognized by others in the prevention field (e.g., Albee, 1996; Cowen, 1994; Hawkins & Catalano, 1990), and has been supported by empirical research (e.g., Battistich et al., 2000; Hawkins, Catalano, Kosterman, Abbott, & Hill, 1999; Solomon, Battistich, Watson, Schaps, & Lewis, 2000; Tolan & Guerra, 1994; Yoshikawa, 1994). However, the health promotion model has

received far less consideration in the field than the risk-reduction, prevention of disorder model (see Coie et al., 1993).

The effects of the CDP program were most recently examined in a large, multi-site demonstration trial involving a diverse sample of 12 program and 12 matched comparison schools from six school districts across the US. Detailed descriptions of the approach to program implementation, research methodology, and findings of the demonstration trial with respect to program implementation and outcomes may be found in Battistich, et al. (2000); Kendzior and Dasho (1996); Solomon, Battistich, Watson, Schaps, and Lewis (2000); Watson (1996); and Watson, Battistich, and Solomon (1997). Overall, the findings from this four-year study showed substantial variability in implementation across the 12 program schools, and a small number of significant positive and negative program effects. However, when implemented widely throughout a school (i.e., “high implementation” elementary schools), the CDP program resulted in a large number of significant outcomes for students, and no statistically reliable differences favoring students at the matched comparison schools. Observed program effects included positive effects on students’ *sense of the school as a community* and other *school-related attitudes and motives* (e.g., liking for school, achievement motivation); *social attitudes, skills, and values* (e.g., concern for others, conflict resolution skill, commitment to democratic values); and involvement in *problem behaviors* (i.e., reduced use of alcohol and marijuana, and less participation in some forms of delinquency, including violent behaviors such as “gang fighting”). Moreover, consistent with the program’s theoretical model, structural equations modeling analyses indicated that virtually all of the program’s effects on student outcome variables were mediated through effects on students’ sense of the school as a community (Solomon et al., 2000; Watson et al., 1997).

The Follow-Up Study

This article presents findings from a follow-up study of a subsample of former CDP program and comparison students while they were in middle school. Specifically, the focus is on students from the six (of 12) CDP program elementary schools and matched comparison schools (matched on the basis of student demographic characteristics and prior achievement) that served the largest numbers of “at risk” students.⁴ Three of the program elementary schools had shown large and widespread changes from baseline in program-relevant teacher practices and attitudes during three years of intervention (the “high implementation” group). The other three program schools had shown positive changes among some teachers but, overall, did not differ significantly from teachers at their matched comparison

⁴An average of 49% of students at these program and comparison elementary schools were eligible for free/reduced price school lunch (range: 5%–95%), and an average of 57% of students were members of ethnic minorities (range: 28%–100%).

schools with respect to changes in practices and attitudes during the elementary school study (Battistich et al., 2000; Solomon et al., 2000).

Given the findings from the elementary school study, we expected that students from the high implementation program schools would show better adjustment during middle school, including “greater bonding” to school, than their matched comparison students. Studywide, however, (i.e., including both “high” and “low” implementing schools), given the mixed findings during elementary school, we had no predictions about the likely results of comparing the entire sample of former program and comparison students during the middle school follow-up study.

METHODS

Sample and Design

The design of the follow-up study continued the cohort-sequential design of the elementary school study. Beginning in 1996–97, former program and comparison students from the six program schools and their matched comparison schools who had participated in the study during elementary school (assessments in the elementary school study were limited to students in the top three grades) were located at 15 middle schools in the participating districts.⁵ Assessments during middle school were conducted annually for four years, by which time the final age-cohort of students who had participated in the elementary school study completed middle school.

Due to a delay in funding, the middle-school assessments did not begin until two years following the end of the elementary school study. As a consequence, 2,559 (35%) of the 7,290 students assessed at the six program and six comparison elementary schools had already graduated from middle school before the start of the follow-up study. The potential middle school sample thus consisted of 4,731 students. Of these 2,747 (58%) were located in middle schools in the participating districts at follow-up.⁶ Compared to the potential sample, former program students (55% vs. 49%; $\chi^2(1) = 18.64$, $p < .0001$) and Hispanics (31% vs. 28%; $\chi^2(1) = 6.97$, $p < .01$) were overrepresented, and males (49% vs. 52%; $\chi^2(1) = 6.39$, $p < .02$) and Whites (37% vs. 41%; $\chi^2(1) = 7.48$, $p < .01$) were underrepresented among the located students. Located students also were less likely to have reported having used marijuana by the end of elementary school than non-located students in the potential sample (5% vs. 8%; $\chi^2(1) = 5.51$, $p < .02$).⁷

⁵With one exception, each of the middle schools was attended by students from both program and comparison elementary schools. The exception was a middle school that was attended by only a small number (41) of comparison students.

⁶This degree of mobility is not particularly surprising among a high risk population.

⁷Data on drug use were only obtained from students at the highest elementary grade. Consequently, these data were only available for a subsample of 1,069 (39%) of located students.

Parental consent to participate in the follow-up study was obtained for 1,246 (45%) of those students who were located in participating middle schools. Consenting students did not differ from non-consenting students with respect to status (program vs. comparison) or gender, but there were proportionately fewer African-Americans among the consenting sample (22% vs. 32%; $\chi^2(1) = 31.05$, $p < .0001$). Consenting students also were less likely to have reported use of alcohol by the end of elementary school than non-consenting students (37% vs. 42%; $\chi^2(1) = 2.87$, $p < .10$).

Overall, the final sample thus was of lower risk for problem behaviors during middle school than those not in the final sample (i.e., more former program students, fewer males and fewer students who had already initiated use of drugs prior to entering middle school). These differences should be kept in mind when interpreting the findings from the follow-up assessments.

The final sample included 700 former program and 546 former comparison students. Males and females were approximately equally represented, and the sample included 503 White (40%), 400 Hispanic (32%), 270 African-American (22%), 64 Asian (5%), and 9 students of other ethnicity (0.6%). Program and comparison students in the final sample did not differ with respect to gender or reported initiation of alcohol use during elementary school. However, there were proportionately fewer Hispanic students among program than comparison students (28% vs. 38%; $\chi^2(1) = 16.48$, $p < .0001$), and program students in the sample were more likely to have initiated tobacco use (22% vs. 13%; $\chi^2(1) = 6.30$, $p < .02$) but less likely to have initiated marijuana use (2% vs. 6%; $\chi^2(1) = 4.86$, $p < .03$) than comparison students during elementary school.

Measures

The annual assessments of student outcomes during middle school were derived from student questionnaires, teacher ratings of student behaviors, and student records.

Student Questionnaires

The student questionnaires assessed outcomes in four domains: school-related attitudes, personal and social attitudes, positive and negative behaviors, and friends' positive and negative behaviors.⁸

The measures of *school-related attitudes* included: (a) *sense of school community* (composed of two nine-item subscales, $\alpha = .81$: school supportiveness [e.g., "Students in this school are willing to go out of their way to help someone."] and

⁸Detailed information about the measures in the student questionnaires is available from the first author upon request.

student autonomy and influence [e.g., “Students help to decide what goes on at this school.”]; (b) *educational aspirations* (single item: “If you could go as far as you wanted to in school, how far would you *like* to go?”); (c) *educational expectations* (single item: “How far do you think you *really will* go in school?”); (d) *trust in and respect for teachers* (six items; $\alpha = .79$; e.g., “I feel safe and comfortable with the teachers in my classes.”); (e) *positive teacher-student relations* (three items; $\alpha = .63$; e.g., “Teachers and students treat each other with respect in this school.”); (f) *liking for school* (six items, $\alpha = .82$; e.g., “I like my school.”); (g) *task orientation toward learning* (eight items; $\alpha = .87$; e.g., “The times I feel best in school are when I solve a problem by working hard.”); (h) *academic self-esteem* (four items; $\alpha = .83$; e.g., “I think I’m a good student.”); and (i) *loneliness at school* (eight items; $\alpha = .83$; e.g., “I don’t have any friends at school.”).

The measures of *personal and social attitudes* included: (a) *concern for others* (10 items; $\alpha = .80$; e.g., “When I see someone having a problem, I want to help.”); (b) *sense of efficacy* (nine items; $\alpha = .81$; e.g., “How sure are you that things will work out well when you have to make an important decision?”); and (c) *global self-esteem* (three items; $\alpha = .79$; e.g., “I like myself just the way I am.”).

The measures of *positive and negative behaviors* included: (a) *victimization at school* (six items; $\alpha = .77$; e.g., “Think back over the time since school started this year. While at school, how many times (if ever) did someone take money or things from you by using force or threatening to hurt you?”); (b) *misconduct at school* (four items; $\alpha = .75$; e.g., “During the past year, about how often have you disobeyed school rules?”); (c) *current tobacco use* (single item: “On how many days did you smoke a cigarette (use smokeless tobacco) in the last month?”); (d) *current alcohol use* (single item: “On how many days did you have an alcoholic drink in the last month [other than for religious purposes]?”); (e) *current marijuana use* (single item: “On how many days did you use marijuana in the last month?”); (f) *current use of other elicit drugs* (single item: “On how many days did you use cocaine, crack cocaine, heroin, amphetamines, tranquilizers, or barbiturates in the last month?”); (g) *delinquent behaviors* (15 items; $\alpha = .90$; e.g., “During the past year, about how often have you used a weapon in a fight?”); (h) *positive youth activities* (six items; $\alpha = .54$; e.g., “Do you take part in any organized sports outside of school, like little league?”); (i) *altruistic behavior* (nine items; $\alpha = .82$; e.g., “During the past year, about how often have you helped or gotten help for someone who was hurt?”); and (j) *attendance at religious services* (single item: “During the past year, about how often have you attended religious services [church, temple, synagogue]?”).

The measures of *friends’ positive and negative behaviors* were: (a) *friends’ drug use* (four items; $\alpha = .87$; e.g., “Of the kids you hang around with, how many drink alcohol [beer, wine, liquor]?”); (b) *friends’ delinquent behaviors* (13 items; $\alpha = .93$; e.g., “Of the kids you hang around with, how many are members of a

gang?"); (c) *friends' misconduct at school* (three items; $\alpha = .63$; e.g., "Of the kids you hang around with, how many show disrespect for teachers?"); (d) *friends' positive involvement in school* (five items; $\alpha = .78$; e.g., "Of the kids you hang around with, how many try hard to do good work in school?"); (e) *friends' involvement in positive youth activities* (two items; inter-item $r = .59$; e.g., "Of the kids you hang around with, how many participate in organized sports or other youth groups [church groups, scouts, etc.] outside of school?"); and (f) *friends attendance at religious services* (single item: "Of the kids you hang around with, how many attend religious services [church, temple, synagogue] regularly?").

Teacher Ratings. Students were randomly assigned to be rated by two or three of their middle school teachers on 10 behavioral descriptions (see Table I), within the constraint that no teacher was asked to rate fewer than five or more than 20 of his/her students. The ratings assessed involvement in school, assertiveness, aggressiveness, popularity, and concern for others.

Student Records. School records provided measures of students' grade-point-average in core academic subjects (i.e., language arts, mathematics, science, and social studies) and scores on district-administered achievement tests.

Procedures

The student questionnaires were group-administered in the spring of each school year by research staff at a location within each of the participating middle schools. Students were assured that their answers were confidential, and the only identifying information on the questionnaire booklets was a bar-code of the students' study identification number.

Rating booklets were prepared and distributed to teachers in the spring of each school year. Teachers returned the completed booklets directly to the research office using postage prepaid envelopes. Teachers were paid a stipend for completing the ratings.

Student record data were collected annually from each district's student database.

Analysis

Data were analyzed using 2 (program vs. comparison) \times 3 (grade) analysis of covariance, controlling for gender and ethnicity.⁹ Program effects were assessed using planned contrasts, one comparing all former program and comparison

⁹It was not possible to control for initiation of drug use in elementary school in these analyses because these data were only available for a small proportion of students: see footnote 4.

Table I. Adjusted^a Mean Scores (Standard Deviations) for Outcome Variables Assessed During Middle School by Program Status and Grade: Full Sample

Variable	Group	Grade			Sig. (effect size)
		6	7	8	
School-related attitudes					
Sense of school community ^b	Comparison	2.74 (0.61)	2.83 (0.58)	2.82 (0.60)	<0.06 (0.09)
	Program	2.90 (0.53)	2.80 (0.59)	2.85 (0.57)	
Educational aspirations ^b	Comparison	4.53 (1.06)	4.59 (0.97)	4.69 (0.89)	
	Program	4.61 (1.03)	4.71 (0.84)	4.70 (0.82)	
Educational expectations ^b	Comparison	4.34 (1.14)	4.35 (1.16)	4.32 (1.11)	
	Program	4.35 (1.08)	4.29 (1.09)	4.26 (1.12)	
Trust in and respect for teachers ^b	Comparison	2.16 (0.48)	2.13 (0.42)	2.13 (0.47)	
	Program	2.21 (0.42)	2.10 (0.44)	2.15 (0.46)	
Positive teacher-student relations ^b	Comparison	3.10 (1.05)	3.06 (0.95)	2.99 (1.01)	<0.04 (0.11)
	Program	3.36 (0.91)	3.05 (0.96)	3.06 (0.95)	
Liking for school ^b	Comparison	3.30 (0.91)	3.25 (0.92)	3.20 (0.93)	<0.04 (0.13)
	Program	3.51 (0.92)	3.26 (0.94)	3.27 (0.92)	
Task orientation toward learning ^b	Comparison	3.30 (0.93)	3.30 (0.94)	3.40 (0.88)	<0.06 (0.10)
	Program	3.53 (0.84)	3.37 (0.85)	3.32 (0.88)	
Academic self-esteem ^b	Comparison	3.97 (0.92)	3.90 (1.01)	4.02 (0.94)	
	Program	3.99 (1.05)	4.05 (0.93)	4.01 (0.97)	
Loneliness at school ^c	Comparison	1.27 (0.39)	1.24 (0.35)	1.22 (0.33)	
	Program	1.31 (0.39)	1.25 (0.38)	1.20 (0.34)	
Academic achievement					
Grade point average ^d (core academic subjects)	Comparison	2.39 (1.11)	2.39 (1.06)	2.43 (1.10)	
	Program	2.52 (0.98)	2.34 (1.07)	2.50 (1.03)	
Achievement test scores ^e	Comparison	50.52 (10.90)	49.34 (9.30)	50.33 (10.10)	
	Program	49.57 (9.62)	48.88 (8.94)	50.40 (10.79)	
Personal and social attitudes					
Concern for others ^b	Comparison	3.43 (0.68)	3.47 (0.71)	3.45 (0.72)	
	Program	3.41 (0.74)	3.40 (0.75)	3.38 (0.73)	
Sense of efficacy ^b	Comparison	3.09 (0.76)	3.20 (0.67)	3.20 (0.71)	<0.01 (0.14)
	Program	3.29 (0.68)	3.23 (0.73)	3.26 (0.71)	
Global self-esteem ^b	Comparison	3.86 (1.12)	3.85 (1.06)	3.90 (1.06)	<0.10 (0.09)
	Program	3.96 (1.09)	3.96 (1.03)	3.97 (1.03)	
Positive and negative behaviors					
Victimization at school ^b	Comparison	2.00 (0.76)	1.89 (0.67)	1.84 (0.73)	<0.10 (-0.08)
	Program	1.88 (0.69)	1.88 (0.75)	1.78 (0.75)	
Tobacco use ^f (past 30 days)	Comparison	0.06 (0.24)	0.10 (0.29)	0.13 (0.34)	
	Program	0.06 (0.25)	0.10 (0.30)	0.12 (0.33)	
Alcohol use ^f (past 30 days)	Comparison	0.08 (0.27)	0.12 (0.33)	0.19 (0.39)	
	Program	0.06 (0.23)	0.10 (0.30)	0.17 (0.38)	
Marijuana use ^f (past 30 days)	Comparison	0.03 (0.18)	0.07 (0.25)	0.08 (0.27)	
	Program	0.02 (0.13)	0.05 (0.23)	0.09 (0.29)	
Other illicit drug use ^f (past 30 days)	Comparison	0.09 (0.28)	0.06 (0.24)	0.06 (0.23)	
	Program	0.08 (0.27)	0.06 (0.24)	0.05 (0.21)	
Delinquent behaviors ^b	Comparison	1.24 (0.48)	1.30 (0.50)	1.32 (0.53)	
	Program	1.28 (0.49)	1.26 (0.46)	1.29 (0.49)	
Misconduct at school ^b	Comparison	1.62 (0.60)	1.83 (0.78)	1.98 (0.86)	<0.07 (-0.09)
	Program	1.58 (0.58)	1.74 (0.74)	1.90 (0.81)	

Table I. (Continued)

Variable	Group	Grade			Sig. (effect size)
		6	7	8	
Involvement in positive youth activities	Comparison	1.72 (1.30)	1.85 (1.38)	1.93 (1.45)	<0.01 (0.14)
	Program	1.94 (1.42)	2.05 (1.53)	2.13 (1.56)	
Altruistic behavior ^b	Comparison	2.63 (0.73)	2.47 (0.81)	2.63 (0.87)	
	Program	2.66 (0.72)	2.45 (0.79)	2.53 (0.84)	
Attendance at religious services ^b	Comparison	3.59 (1.49)	3.67 (1.42)	3.54 (1.48)	
	Program	3.62 (1.38)	3.59 (1.42)	3.48 (1.46)	
Friends' positive and negative behaviors					
Friends' drug use ^b	Comparison	1.47 (0.72)	1.77 (0.89)	1.99 (1.01)	
	Program	1.52 (0.79)	1.77 (0.87)	1.94 (0.96)	
Friends' delinquent behaviors ^b	Comparison	1.53 (0.60)	1.67 (0.67)	1.76 (0.73)	
	Program	1.63 (0.73)	1.70 (0.73)	1.74 (0.73)	
Friends' misconduct at school ^b	Comparison	2.16 (0.91)	2.39 (0.89)	2.49 (0.97)	
	Program	2.14 (0.86)	2.35 (0.93)	2.46 (0.94)	
Friends' positive involvement in school ^b	Comparison	3.53 (0.85)	3.33 (0.86)	3.40 (0.86)	
	Program	3.51 (0.81)	3.32 (0.92)	3.50 (0.83)	
Friends' involvement in positive youth activities ^b	Comparison	3.20 (1.02)	2.96 (1.04)	2.99 (1.08)	
	Program	3.14 (1.13)	2.99 (1.01)	3.07 (1.09)	
Friends' attendance at religious services ^b	Comparison	3.43 (1.21)	3.11 (1.21)	3.07 (1.18)	
	Program	3.29 (1.24)	3.03 (1.21)	3.06 (1.19)	
Teacher ratings of behavior					
Comes to class and completes assignments on time, tries to learn the material, and does the best work he/she can ^g	Comparison	4.51 (2.29)	5.09 (1.74)	4.68 (1.91)	
	Program	4.93 (2.06)	4.82 (1.80)	4.94 (1.82)	
Is quiet and withdrawn in class, and avoids getting involved with other students ^g	Comparison	2.55 (1.85)	2.47 (1.53)	3.03 (1.80)	
	Program	3.51 (2.03)	2.63 (1.70)	2.66 (1.69)	
Likes to set his/her own tasks and goals, and works well without explicit direction from the teacher ^g	Comparison	3.93 (2.09)	4.31 (1.66)	3.74 (1.92)	
	Program	4.18 (2.20)	3.93 (1.80)	4.05 (1.87)	
Insults or teases others, tries to get others into trouble, and/or starts fights or destroys other's property ^g	Comparison	2.12 (1.87)	1.68 (1.33)	1.90 (1.52)	
	Program	1.88 (1.24)	1.93 (1.54)	1.94 (1.47)	
Gets along well with others, is sought out by his/her fellow students, and has many friends ^g	Comparison	4.17 (1.96)	4.84 (1.42)	4.73 (1.62)	<0.09 (0.17)
	Program	5.02 (1.50)	4.54 (1.55)	4.97 (1.49)	

Table I. (Continued)

Variable	Group	Grade			Sig. (effect size)
		6	7	8	
Is not interested in what goes on in class and participates minimally, with little apparent enjoyment ^g	Comparison	2.73 (2.16)	2.54 (1.70)	2.91 (1.83)	
	Program	2.66 (1.73)	2.74 (1.72)	2.67 (1.73)	
Does not hesitate to state opinions, even when others disagree with his/her views ^g	Comparison	3.64 (2.05)	4.18 (1.75)	3.70 (1.90)	
	Program	3.40 (1.81)	3.93 (1.76)	4.01 (1.78)	
Is engaged in class: participates in discussions, stays on the topic, and generally takes an active part in whatever the class is doing ^g	Comparison	4.02 (2.16)	4.69 (1.78)	4.13 (1.84)	
	Program	4.62 (1.89)	4.31 (1.76)	4.55 (1.84)	
Appears to be socially awkward and inept: tends to say the "wrong thing," and to be rebuffed or ridiculed by other students ^g	Comparison	2.07 (1.53)	2.04 (1.37)	1.85 (1.30)	
	Program	1.57 (0.75)	2.12 (1.38)	1.89 (1.32)	
Considers others' feelings, treats them with respect, and offers and gives help to those who need it ^g	Comparison	4.52 (2.17)	5.34 (1.50)	4.83 (1.76)	
	Program	4.92 (1.68)	4.79 (1.58)	4.83 (1.68)	

Note. Sample sizes are approximately 1,850 for the attitude and behavior variables, 2,200 for the academic achievement data, and 970 for the teacher ratings.

^a Adjusted for gender and ethnicity.

^b Range: 1–5.

^c Range: 1–3.

^d $F = 0$, $A = 4$.

^e T scored within district and year ($M = 50$, $SD = 10$).

^f No = 0, Yes = 1.

^g Range: 1–7.

students, and the second comparing program and comparison students from the "high implementation" group.¹⁰

¹⁰ Obviously, it would have been preferable to use repeated-measures analysis of variance to analyze the middle school data. However, because data were missing by design for over half of the students in the follow-up sample, restricting analyses to the subjects with complete data would have severely restricted the sample size and probably introduced serious bias in the findings. Similarly, it would have been preferable to use multi-level regression in order to take the clustering of students within schools into account. However, with a sample of only 12 middle schools, statistical power to detect program effects is quite poor (e.g., Bassiri, 1998).

RESULTS

Studywide Findings

Results from studywide comparisons are summarized in Table I. Four of the 40 variables assessed during middle school showed statistically significant ($p < .05$) differences favoring program students. Six other variables showed “marginally” significant ($p < .10$) differences favoring program students. There were no statistically reliable differences favoring comparison students. Overall, then, 40% of the outcome variables examined during middle school showed differences favoring program students. All of these differences represent “small” effects.¹¹

School-Related Attitudes and Academic Performance

Four of the 11 variables in this domain showed significant effects favoring program students (see Table I). Program students scored higher than comparison students in sense of school community ($F[1,1877] = 3.55, p < .06$), positive teacher-student relations ($F[1,1878] = 4.65, p < .04$), liking for school ($F[1,1880] = 4.22, p < .04$), and task orientation toward learning ($F[1,1879] = 3.82, p < .06$). However, these results were qualified by significant Status x Grade interactions for sense of community and task orientation toward learning (Status x Linear Grade contrast $t_s > 2.30, p_s < .02$): In each case, program students’ scores declined during middle school, whereas comparison students’ scores increased.

The full sample of program and comparison students did not differ with respect to academic performance during middle school.

Personal and Social Attitudes

During middle school, program students scored higher than comparison students in sense of efficacy ($F[1,1875] = 7.02, p < .01$) and global self-esteem ($F[1,1878] = 2.74, p < .10$). Program and comparison students did not differ reliably in their concern for others during middle school.

Positive and Negative Behaviors

Although the program and comparison students did not differ with respect to their involvement in drug use or serious delinquency during middle school,

¹¹The effect size (ES) index shown in the tables is Cohen’s (1977) d : the difference between mean scores for program and comparison students divided by the pooled within-groups standard deviation. By convention, an ES of .2 is considered a “small” effect, an ES of .5 is considered a “moderate” effect, and an ES of .8 is considered a “large” effect.

program students were less involved in misconduct at school than comparison students ($F[1,1852] = 3.29, p < .07$), and were more involved than comparison students in positive youth activities (e.g., sports, community youth groups; $F[1,1858] = 7.06, p < .01$).

Friends' Positive and Negative Behaviors

There were no differences between program and comparison students in their friends' involvement in positive and negative behaviors during middle school.

Teacher Ratings of Behavior

Only one of the 10 teacher ratings showed a significant difference favoring program students during middle school: teachers rated program students as being more socially skilled and popular than comparison students ($F[1,960] = 2.97, p < .09$). However, there was a statistically reliable Status x Grade interaction ($t = 2.10, p < .04$) indicating that program students decreased in popularity as they progressed through middle school, whereas comparison students increased in popularity. Similarly, although the overall difference between program and comparison students was not statistically reliable, program students were rated as being less withdrawn in class as they progressed through middle school, whereas teachers' ratings of comparison students' withdrawal increased (Status x Linear Grade contrast $t = 2.24, p < .03$).

Findings for the High Implementation Group

Findings during middle school for program students from "high implementing" elementary schools and students from their matched comparison schools are summarized in Table II. Twenty of the 40 outcome variables examined showed statistically significant ($p < .05$) differences favoring program students. An additional 6 variables showed "marginally" significant ($p < .10$) differences favoring program students. Overall, then, almost two-thirds (65%) of the outcome variables examined during middle school showed differences favoring program students, with most of the effects ranging between one-fifth and one-third of a standard deviation in magnitude. There were no statistically reliable differences favoring comparison students.¹²

¹²The probability of a Type I error in one or more of the 40 independent tests on outcome variables is virtually 1.0. Using the Bonferroni inequality, maintaining a probability of no larger than .05 of one or more Type I errors across 40 tests would require setting $p = .001$ for each test. However, as Hayes (1981) notes, the Bonferroni correction is "intolerably conservative" (p. 435) when the number of tests is large, as in the present case. Readers concerned about Type I errors might adopt $p = .01$ when considering which program effects are "statistically significant." However, it should be kept in mind that there are *no* significant differences favoring comparison students, even at $p < .10$.

Table II. Adjusted^a Mean Scores (Standard Deviations) for Outcome Variables Assessed During Middle School by Program Status and Grade: High Implementation Subsample

Variable	Group	Grade			Sig. (effect size)
		6	7	8	
School-related attitudes					
Sense of school community ^b	Comparison	2.72 (0.59)	2.79 (0.57)	2.76 (0.59)	<0.02 (0.21)
	Program	2.92 (0.54)	2.82 (0.59)	2.88 (0.57)	
Educational aspirations ^b	Comparison	4.11 (1.32)	4.31 (1.22)	4.56 (1.02)	<0.01 (0.23)
	Program	4.45 (1.22)	4.65 (0.92)	4.62 (0.89)	
Educational expectations ^b	Comparison	3.86 (1.38)	4.09 (1.34)	4.18 (1.17)	<0.10 (0.14)
	Program	4.21 (1.12)	4.21 (1.13)	4.19 (1.15)	
Trust in and respect for teachers ^b	Comparison	2.10 (0.46)	2.07 (0.45)	2.13 (0.47)	<0.005 (0.23)
	Program	2.27 (0.37)	2.14 (0.44)	2.21 (0.45)	
Positive teacher-student relations ^b	Comparison	2.95 (1.01)	2.90 (0.98)	3.01 (1.03)	<0.001 (0.29)
	Program	3.40 (0.87)	3.10 (0.95)	3.18 (0.97)	
Liking for school ^b	Comparison	3.19 (0.97)	3.16 (0.92)	3.29 (0.90)	<0.004 (0.24)
	Program	3.59 (0.79)	3.31 (0.95)	3.39 (0.90)	
Task orientation toward learning ^b	Comparison	3.28 (1.00)	3.57 (0.90)	3.58 (0.78)	<0.04 (0.17)
	Program	3.67 (0.72)	3.41 (0.85)	3.41 (0.90)	
Academic self-esteem ^b	Comparison	3.87 (0.88)	3.81 (1.03)	4.01 (0.88)	<0.04 (0.17)
	Program	3.97 (1.01)	4.14 (0.84)	4.06 (0.99)	
Loneliness at school ^c	Comparison	1.34 (0.44)	1.34 (0.40)	1.28 (0.40)	<0.10 (-0.13)
	Program	1.34 (0.38)	1.27 (0.39)	1.21 (0.35)	
Academic achievement					
Grade point average ^d (core academic subjects)	Comparison	2.04 (1.28)	2.05 (1.08)	1.98 (1.15)	<0.0001 (0.37)
	Program	2.45 (1.06)	2.26 (1.16)	2.45 (1.05)	
Achievement test scores ^e	Comparison	37.59 (4.15)	42.40 (6.89)	45.66 (10.82)	<0.002 (0.37)
	Program	42.42 (6.38)	44.76 (8.32)	48.33 (12.22)	
Personal and social attitudes					
Concern for others ^b	Comparison	3.24 (0.65)	3.30 (0.70)	3.31 (0.70)	<0.04 (0.12)
	Program	3.31 (0.69)	3.35 (0.78)	3.35 (0.74)	
Sense of efficacy ^b	Comparison	3.05 (0.76)	3.17 (0.70)	3.27 (0.67)	<0.04 (0.12)
	Program	3.27 (0.67)	3.26 (0.69)	3.32 (0.72)	
Global self-esteem ^b	Comparison	3.78 (1.18)	3.95 (1.06)	4.02 (1.04)	<0.04 (0.12)
	Program	3.94 (1.06)	3.98 (1.02)	4.00 (1.02)	
Positive and negative behaviors					
Victimization at school ^b	Comparison	2.16 (0.87)	2.07 (0.76)	1.88 (0.69)	<0.003 (-0.26)
	Program	1.88 (0.63)	1.89 (0.71)	1.79 (0.77)	
Tobacco use ^f (past 30 days)	Comparison	0.13 (0.33)	0.16 (0.36)	0.16 (0.37)	<0.04 (0.12)
	Program	0.07 (0.27)	0.13 (0.34)	0.16 (0.37)	
Alcohol use ^f (past 30 days)	Comparison	0.09 (0.28)	0.16 (0.37)	0.16 (0.37)	<0.04 (0.12)
	Program	0.05 (0.23)	0.09 (0.29)	0.15 (0.36)	
Marijuana use ^f (past 30 days)	Comparison	0.06 (0.25)	0.10 (0.30)	0.10 (0.30)	<0.04 (0.12)
	Program	0.03 (0.15)	0.07 (0.25)	0.11 (0.31)	
Other illicit drug use ^f (past 30 days)	Comparison	0.13 (0.33)	0.11 (0.32)	0.05 (0.22)	<0.04 (0.12)
	Program	0.08 (0.27)	0.08 (0.27)	0.05 (0.22)	
Delinquent behaviors ^b	Comparison	1.44 (0.67)	1.41 (0.63)	1.32 (0.48)	<0.04 (-0.18)
	Program	1.32 (0.54)	1.28 (0.52)	1.30 (0.50)	
Misconduct at school ^b	Comparison	1.83 (0.74)	1.88 (0.92)	1.91 (0.77)	<0.003 (-0.25)
	Program	1.54 (0.55)	1.70 (0.65)	1.81 (0.76)	

Table II. (Continued)

Variable	Group	Grade			Sig. (effect size)
		6	7	8	
Involvement in positive youth activities	Comparison	1.77 (1.36)	1.89 (1.48)	2.06 (1.52)	<0.001 (0.29)
	Program	2.12 (1.45)	2.34 (1.58)	2.52 (1.52)	
Altruistic behavior ^b	Comparison	2.58 (0.74)	2.48 (0.72)	2.57 (0.85)	
	Program	2.53 (0.73)	2.49 (0.80)	2.56 (0.86)	
Attendance at religious services ^b	Comparison	3.48 (1.60)	3.35 (1.49)	3.29 (1.55)	<0.05 (0.16)
	Program	3.63 (1.39)	3.70 (1.35)	3.60 (1.43)	
Friends' positive and negative behaviors					
Friends' drug use ^b	Comparison	1.74 (0.83)	1.97 (0.98)	2.16 (1.01)	<0.08 (-0.15)
	Program	1.63 (0.81)	1.83 (0.84)	2.01 (0.97)	
Friends' delinquent behaviors ^b	Comparison	1.82 (0.74)	1.91 (0.82)	1.87 (0.75)	<0.05 (-0.17)
	Program	1.74 (0.75)	1.72 (0.72)	1.79 (0.76)	
Friends' misconduct at school ^b	Comparison	2.39 (0.89)	2.52 (0.93)	2.47 (0.90)	<0.02 (-0.20)
	Program	2.20 (0.95)	2.30 (0.90)	2.36 (0.95)	
Friends' positive involvement in school ^b	Comparison	3.23 (0.76)	3.16 (0.89)	3.31 (0.85)	<0.005 (0.23)
	Program	3.46 (0.87)	3.36 (0.95)	3.50 (0.87)	
Friends' involvement in positive youth activities ^b	Comparison	3.07 (1.01)	3.04 (1.11)	2.88 (1.12)	
	Program	3.16 (1.15)	3.08 (1.14)	3.14 (1.13)	
Friends' attendance at religious services ^b	Comparison	3.12 (1.23)	2.89 (1.20)	2.86 (1.22)	
	Program	3.19 (1.24)	3.01 (1.26)	2.99 (1.27)	
Teacher ratings of behavior					
Comes to class and completes assignments on time, tries to learn the material, and does the best work he/she can ^g	Comparison	3.26 (1.96)	4.79 (1.95)	4.10 (1.94)	<0.07 (0.31)
	Program	4.21 (1.27)	4.71 (1.73)	4.82 (1.74)	
Is quiet and withdrawn in class, and avoids getting involved with other students ^g	Comparison	2.37 (1.91)	2.71 (1.75)	3.02 (1.77)	
	Program	2.27 (1.39)	2.80 (1.61)	2.45 (1.67)	
Likes to set his/her own tasks and goals, and works well without explicit direction from the teacher ^g	Comparison	2.86 (1.46)	4.24 (1.53)	2.97 (1.74)	
	Program	3.06 (1.90)	3.79 (1.80)	3.90 (1.82)	
Insults or teases others, tries to get others into trouble, and/or starts fights or destroys other's property ^g	Comparison	2.82 (2.27)	2.09 (1.46)	2.13 (1.57)	
	Program	2.72 (1.49)	2.15 (1.56)	2.34 (1.60)	
Gets along well with others, is sought out by his/her fellow students, and has many friends ^g	Comparison	2.61 (1.03)	4.37 (1.50)	4.14 (1.71)	<0.003 (0.48)
	Program	4.30 (0.86)	4.25 (1.76)	4.81 (1.50)	
Is not interested in what goes on in class and participates minimally, with little apparent enjoyment ^g	Comparison	3.40 (2.09)	2.88 (1.65)	3.11 (1.82)	
	Program	3.25 (1.49)	2.85 (1.60)	2.65 (1.67)	

Table II. (Continued)

Variable	Group	Grade			Sig. (effect size)
		6	7	8	
Does not hesitate to state opinions, even when others disagree with his/her views ^g	Comparison	3.08 (2.12)	4.26 (1.89)	3.51 (1.83)	<0.10 (0.27)
	Program	4.08 (1.47)	3.88 (1.80)	4.33 (1.68)	
Is engaged in class: participates in discussions, stays on the topic, and generally takes an active part in whatever the class is doing ^g	Comparison	2.89 (1.64)	4.02 (1.90)	3.44 (1.74)	<0.02 (0.39)
	Program	3.79 (1.63)	4.02 (1.78)	4.56 (1.78)	
Appears to be socially awkward and inept: tends to say the "wrong thing," and to be rebuffed or ridiculed by other students ^g	Comparison	2.79 (1.69)	2.50 (1.49)	2.14 (1.36)	<0.05 (-0.33)
	Program	1.80 (0.88)	2.30 (1.27)	2.02 (1.34)	
Considers others' feelings, treats them with respect, and offers and gives help to those who need it ^g	Comparison	3.29 (1.92)	4.79 (1.48)	4.10 (1.82)	<0.10 (0.27)
	Program	4.19 (1.23)	4.55 (1.62)	4.73 (1.65)	

Note. Sample sizes are approximately 775 for the attitude and behavior variables, 900 for the academic achievement data, and 350 for the teacher ratings.

^a Adjusted for gender and ethnicity.

^b Range: 1-5.

^c Range: 1-3.

^d $F = 0, A = 4$.

^e T -scored within district and year ($M = 50, SD = 10$).

^f No = 0, Yes = 1.

^g Range: 1-7.

School-Related Attitudes and Academic Performance

The most widespread area of significant program effects during middle school was with respect to students' school-related attitudes and academic performance. Fully 10 of the 11 variables in this area in Table II show differences favoring program students, including sense of school as a community ($F[1,760] = 6.43, p < .02$), educational aspirations ($F[1,759] = 8.35, p < .01$), trust in and respect for teachers ($F[1,758] = 7.93, p < .005$), and liking for school ($F[1,761] = 8.61, p < .004$). Program students also had significantly higher grade-point-averages ($F[1,962] = 25.43, p < .0001$) and achievement test scores ($F[1,839] = 9.91, p < .002$) than comparison students. The only outcome variable that did not show a difference favoring program students was task orientation toward learning, for which a significant Status x Grade interaction was observed (Status x Linear Grade

contrast $t = 3.35$, $p < .001$): program students scored higher than comparison students on this measure of learning motivation in 6th grade but subsequently declined, whereas scores for comparison students increased after 6th grade.

Personal and Social Attitudes

Program students scored significantly higher than comparison students in sense of efficacy during middle school ($F[1,760] = 4.60$, $p < .04$). The two groups of students did not differ in concern for others or global self-esteem.

Positive and Negative Behaviors

Positive program effects were found for half of the 10 measures of positive and negative behaviors in Table II. Program students reported being victimized at school less often than comparison students ($F[1,759] = 9.58$, $p < .003$), engaged in less misconduct at school ($F[1,756] = 9.25$, $p < .003$), and engaged in fewer acts of delinquency ($F[1,756] = 4.67$, $p < .04$). Program students also were more involved than comparison students in positive youth activities (e.g., sports, community youth groups) during middle school ($F[1,758] = 11.70$, $p < .001$), and attended religious services more frequently ($F[1,747] = 3.89$, $p < .05$). The two groups of students did not differ significantly during middle school in their reported frequency of engaging in altruistic behavior, or in their reported use of alcohol and other drugs.

Friends' Positive and Negative Behaviors

Not only did program students appear to be more involved in school and positive youth activities and less involved in negative behaviors than comparison students during middle school, they also reported that more of their friends (i.e., "the kids you hang out with most often") are similarly engaged. Significant differences favoring program students were observed for four of the six measures of friends' behavior in Table II. Program students reported that more of their friends were positively involved in school (e.g., worked hard, completed assignments) than did comparison students ($F[1,758] = 8.03$, $p < .005$), and that fewer of their friends were involved in misconduct at school ($F[1,759] = 5.46$, $p < .02$), used drugs ($F[1,754] = 3.25$, $p < .08$), or engaged in delinquent behaviors ($F[1,754] = 4.14$, $p < .05$). Program students also reported that more of their friends attended religious services and were involved in positive youth activities than did comparison students, but these differences were not statistically reliable.

Teacher Ratings of Behavior

Six of the 10 teacher ratings showed significant effects favoring program students during middle school. Program students were rated by their teachers as being more reliable and hardworking students ($F[1,345] = 3.46, p < .07$) and more actively engaged in class than comparison students ($F[1,344] = 5.45, p < .02$); as being more socially skilled and popular ($F[1,344] = 8.67, p < .003$), more assertive ($F[1,343] = 2.70, p < .10$), and less socially inept ($F[1,343] = 3.96, p < .05$); and as being more considerate, respectful, and helpful to others than comparison students ($F[1,343] = 2.64, p < .10$).

DISCUSSION

Overall, the findings strongly suggest that the Child Development Project had a number of continuing positive effects on students after they had left the program environment of their elementary schools. This was predicted for students from “high implementing” program elementary schools. However, and somewhat surprising given the mixed overall findings from the elementary study, the study-wide follow-up findings (i.e., including students from “low implementing” as well as “high implementing” schools) also showed a clear pattern of positive effects, although fewer in number and smaller in magnitude than for the “high implementation” group. Some of the effects observed in middle school were continuations of effects that were found during elementary school (e.g., sense of school community, liking for school, sense of efficacy), and some were new effects on outcomes that had not been examined in elementary school (e.g., misconduct at school, involvement in positive youth activities, peer behaviors). In one case, alcohol and marijuana use, program effects that were observed during elementary school were not found during follow-up in middle school.

It is particularly encouraging that, relative to comparison students, CDP students in middle school appeared to be much more “connected” to school (e.g., had a greater sense of the school as a community, liked school more, worked harder and were more engaged in their courses, had greater trust in and respect for teachers, had higher educational aspirations). Prior research (e.g., Battistich & Hom, 1997; Resnick et al., 1997) has found that school connectedness is protective against a wide range of negative outcomes for youth. In addition, CDP students from the “high implementation” group had significantly higher test scores and grades in core academic subjects, were more involved in positive youth activities, and engaged in less misconduct at school and less delinquency than comparison students. These CDP students also reported that more of their friends were positively involved in school and fewer of their friends engaged in misconduct at school or delinquent behaviors than did comparison students. Given these findings, it is disappointing

that there were no significant effects in the area of alcohol and other drug use, particularly since significant program effects on alcohol and marijuana use were found during the elementary school study. However, as noted above, the consenting follow-up sample was of lower risk than students who were lost to follow-up, and the relatively low prevalence rates for drug use observed during middle school (see Tables I and II) militated against detecting statistically reliable effects on these outcome variables.

Although clearly encouraging, it is important to keep in mind that the present findings are limited in important ways. In particular, the longitudinal nature of the data was ignored in these analyses because to do otherwise would have severely restricted the sample size. This is largely because there are substantial data that are missing by design. For example, students who were assessed in 8th grade in 1997 would be completely missing data from their 6th and 7th grade years. Of the four age-cohorts that were assessed during the middle school study, one had only a single year of data, and a second had only two years of data. Thus, restricting the analyses to the two cohorts of students who had three years of middle school data would have thrown out half of the sample, and almost certainly introduced serious bias. Additional data are missing for a variety of other reasons (e.g., not all teachers completed the rating booklets each year), most of which, like the data missing by design, can be considered missing at random. Rather than discard these cases, multiple imputation (Rubin, 1987; Schafer, 1997) will be used in the future to construct several complete longitudinal data sets, which can then be analyzed using typical "complete case" methods (e.g., repeated measures ANOVA, growth modeling), but with uncertainty due to missing data taken appropriately into account in making inferences from these analyses.

Even with multiply-imputed, complete-case data sets, analyses of mean differences such as those conducted here will not answer questions about *how* these longer-term effects in middle school of an elementary school intervention were obtained. That is, they do not address questions about how the different experiences of program and comparison students during elementary school led to different approaches to adapting to the middle school environment. Similar to the social development model (Hawkins & Weiss, 1985), CDP's underlying theoretical model places causal primacy on students' bonding to school. Bonding during elementary school is likely to predispose students to bond to the middle school environment, as indicated by the present findings that former program students had a stronger sense of school community, liked school more, and were more engaged in and committed to school than comparison students. Their positive connection to school also is likely to predispose them to seek out and associate with others who are similarly bonded to school. Consistent with differential association theory (Sutherland & Cressey, 1960), former program and comparison students in this study associated with different peer groups, which may have differentially influenced their tendencies to engage in prosocial or antisocial behaviors. In future analyses, these (and other) plausible models will be examined using structural equations

modeling techniques to assess their fit with the observed relationships in the data.

ACKNOWLEDGMENTS

This research was supported by grant R01-DA09846 from the National Institute on Drug Abuse. The opinions expressed are those of the authors and not necessarily those of the funding agency. Portions of this research were presented at the meeting of the American Educational Research Association, Seattle, April 2001. We gratefully acknowledge the seminal contributions of Daniel Solomon and Marilyn Watson to the development of the Child Development Project, and the assistance of Marilyn Coslow, Bill and Barbara Krause, and Linda Sorhaindo with data collection.

REFERENCES

- Albee, G. W. (1996). Revolutions and counterrevolutions in prevention. *American Psychologist, 51*, 1130–1133.
- Bassiri, D. (1988, April). *Large and small sample properties of maximum likelihood estimates for the hierarchical linear model*. Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA.
- Battistich, V., & Hom, A. (1997). The relationships between students' sense of their school as a community and their involvement in problem behaviors. *American Journal of Public Health, 87*, 1997–2001.
- Battistich, V., Schaps, E., Solomon, D., & Watson, M. (1991). The role of the school in prosocial development. In H. E. Fitzgerald, B. M. Lester, & M. W. Yogman (Eds.), *Theory and research in behavioral pediatrics* (Vol. 5). New York: Plenum.
- Battistich, V., Schaps, E., Watson, M., Solomon, D., & Lewis, C. (2000). Effects of the Child Development Project on students' drug use and other problem behaviors. *Journal of Primary Prevention, 21*, 75–99.
- Battistich, V., Solomon, D., Watson, M., & Schaps, E. (1997). Caring school communities. *Educational Psychologist, 32*, 137–151.
- Brener, N. D., Simon, T. R., Krug, E. G., & Lowry, R. (1999). Recent trends in violence-related behaviors among high school students in the United States. *Journal of the American Medical Association, 282*, 440–446.
- Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist, 32*, 513–531.
- Catalano, R. F., Berglund, M. L., Ryan, J. A. M., Lonczak, H. S., & Hawkins, J. D. (1999). *Positive youth development in the United States: Research findings on evaluations of the Positive Youth Development Programs*. Report to the US Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation and National Institute for Child Health and Human Development. Available on the World Wide Web: <http://aspe.hhs.gov/hsp/PositiveYouthDev99/index.htm>
- Center for Substance Abuse Prevention. (1999). *Understanding substance abuse prevention. Toward the 21st Century: A primer on effective programs* (DHHS Publication No. SMA 99-3301). Washington, DC: U.S. Government Printing Office.
- Cohen, J. (1977). *Statistical power analysis for the behavioral sciences* (Rev. ed.). New York: Academic Press.

- Coie, J. D., Watt, N. F., West, S. G., Hawkins, J. D., Asarnow, J. R., Markman, H. J., et al. (1993). The science of prevention: A conceptual framework and some directions for a national research program. *American Psychologist*, *48*, 1013–1022.
- Cowen, E. L. (1994). The enhancement of psychological wellness: Challenges and opportunities. *American Journal of Community Psychology*, *22*, 149–179.
- Greenberg, M. T., Domitrovich, C., & Bumbarger, B. (2001). The prevention of mental disorders in school-aged children: Current state of the field. *Prevention and Treatment*, *4*, Article 1. Available on the World Wide Web: <http://journals.apa.org/prevention/volume4/pre0040001a.html>
- Hawkins, J. D., & Catalano, R. F. (1990). Broadening the vision of education: Schools as health promoting environments. *Journal of School Health*, *60*, 178–181.
- Hawkins, J. D., Catalano, R. F., Kosterman, R., Abbott, R., & Hill, K. G. (1999). Preventing adolescent health-risk behaviors by strengthening protection during childhood. *Archives of Pediatrics and Adolescent Medicine*, *153*, 226–234.
- Hawkins, J., & Weiss, J. (1985). The social development model: An integrated approach to delinquency prevention. *Journal of Primary Prevention*, *6*, 73–97.
- Johnston, L. D., O'Malley, P. M., & Bachman, J. G. (2001). *Monitoring the future national survey results on drug use, 1975–2000. Vol. I: Secondary school students* (NIH Publication No. 01-4924). Bethesda, MD: National Institute on Drug Abuse.
- Kendzior, S., & Dasho, S. (1996, April). *A model for deep, long-term change in teachers' beliefs and practices*. Paper presented at the meeting of the American Educational Research Association, San Francisco.
- O'Connor, T. G., & Rutter, M. (1996). Risk mechanisms in development: Some conceptual and methodological considerations. *Developmental Psychology*, *32*, 787–795.
- Resnick, M. D., Bearman, P. S., Blum, R. W., Bauman, K. E., Harris, K. M., Jones, J., et al. (1997). Protecting adolescents from harm: Findings from the national longitudinal study on adolescent health. *Journal of the American Medical Association*, *278*, 823–832.
- Rubin, D. B. (1987). *Multiple imputation for nonresponse in surveys*. New York: Wiley.
- Schafer, J. L. (1997). *Analysis of incomplete multivariate data*. London: Chapman & Hall.
- Solomon, D., Battistich, V., Watson, M., Schaps, E., & Lewis, C. (2000). A six-district study of educational change: Direct and mediated effects of the Child Development Project. *Social Psychology of Education*, *4*, 3–51.
- Sutherland, E. H., & Cressey, D. R. (1960). *Principles of criminology* (6th. ed.). Philadelphia: Lippincott.
- Tolan, P. H., & Guerra, N. G. (1994). Prevention of delinquency: Current status and issues. *Applied and Preventive Psychology*, *3*, 251–273.
- Tolan, P. H., Guerra, N. G., & Kendall, P. C. (1995). A developmental-ecological perspective on antisocial behavior in children and adolescents: Toward a unified risk and intervention framework. Special Section: Prediction and prevention of child and adolescent antisocial behavior. *Journal of Consulting and Clinical Psychology*, *63*, 579–584.
- Watson, M. (1996, April). *Giving content to restructuring: A social, ethical and intellectual agenda for elementary education*. Paper presented at the meeting of the American Educational Research Association, San Francisco.
- Watson, M., Battistich, V., & Solomon, D. (1997). Enhancing students' social and ethical development in schools: An intervention program and its effects. *International Journal of Educational Research*, *27*, 571–586.
- Watson, M., Solomon, D., Battistich, V., Schaps, E., & Solomon, J. (1989). The Child Development Project: Combining traditional and developmental approaches to values education. In L. Nucci (Ed.), *Moral development and character education: A dialogue* (pp. 51–92). Berkeley, VA: McCutchan.
- Yoshikawa, H. (1994). Prevention as cumulative protection: Effects of early family support and education on chronic delinquency and its risks. *Psychological Bulletin*, *115*, 28–54.
- Zimmerman, M. A., & Arunkumar, R. (1994). Resiliency research: Implications for schools and policy. *Social Policy Report, Society for Research in Child Development*, *VIII*(4).